Loop-O9400R
SDH/SONET ADM/TM

Features:

- 6U height, full front access (ETSI) shelf
- Hot-swappable cross-connect modules, tributary modules and power modules
- Temperature-controlled fan tray
- Aggregate cross-connect modules (controller modules)
  - Up to STM-1/4/16 (OC-3/12/48) aggregate lines with software configuration (CC16)
  - Up to STM-1/4 (OC-3/12) aggregate lines with software configuration (CC4)
- Tributary modules
  - 8 tributary slots
    - Dual ports STM-1/4 (OC-3/12) module
    - Triple ports E3/T3 module
    - 16/32/63 ports E1/T1 tributary module
    - 1 GbE and 8 FE tributary module with L2 switch
    - 1 GbE or 8 FE tributary module without L2 switch
    - 7 FOM module
- Power Modules
  - DC module (-36 to -72 Vdc)
  - AC/DC hybrid module (90 to 240 Vac; -36 to -72 Vdc)
  - Dual power (1+ 1) protection
- Protection
  - Controller-Cross-connect Unit (XCU) protection, MSP (1+1), SNCP/UPSR
  - Tributary protection
    - E1/T1: Card, Port, Line
    - E3/T3: Line
    - B155/622: MSP, SNCP/UPSR
    - Ethernet
    - FOM: Line
- TM, ADM, and cross-connect
- Full cross-connect at VC11/VC12/VC3/VC4 levels
- External/Internal/Line timing source with SSM
- Ethernet supports GFP, LAPS, VCAT, BCP, LCAS and non-LCAS
- Ethernet Order Wire (EOW) using VoIP technology
- Management
  - Console port, VT100 menu-driven
  - SNMP port: supports v1 and v3
  - Telnet
  - Centralized management with Loop's EMS/iNMS over DCC channel
  - LoopView GUI EMS Element Management System
  - TMN management (Loop-iNMS) with full FCAPS and end-to-end circuit management
  - SSH
- RoHS compliant

Description:

Loop-O9400R STM-1/4/16 (OC-3/12/48) is a standard compliant high density NGN SDH/SONET ADM/TM with a full T1/E1 cross-connect rack system.

The O9400R has full add and drop capability according to the figures below:

- For controller STM-1/4 (OC-3/12) aggregate cross connect module, up to
  - 1 STM-4 tributary
  - 8 STM-1 tributaries
  - 18 E3/T3 tributaries
  - 378 E1/T1 tributaries
  - 48 10/100M Ethernet EoS tributaries
  - 6 GbE EoS tributaries

- For controller STM-1/4/16 (OC-3/12/48) aggregate cross connect module, up to:
  - 4 STM-4 tributaries
  - 16 STM-1 tributaries
  - 24 E3/T3 tributaries
  - 504 E1/T1 tributaries
  - 64 10/100M Ethernet EoS tributaries
  - 8 GbE EoS tributaries
  - 56 FOM tributaries

With up to 4 STM-1/4/16 (OC-3/12/48) aggregate interfaces on cross-connect modules and 16 STM-1 (OC-3) interfaces on tributaries, the Loop-O9400R offers the service provider a a versatile protection scheme including SNCP (UPSR), and MSP (1+1) protection for both ring and linear network topology.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The Loop-O9400R provides powerful Operation, Administration, Maintenance and Provisioning (OAM&P) functionality, including fault management, performance monitoring, configuration management, and network security management. Through a console port, LAN port, In-band E1, and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

The Loop-O9400R provides a complete set of operation interfaces that are consistent with the Telecommunication Management Network (TMN) concept (ITU Recommendation M.30, G.784) for SDH/SONET Network Element/Operations System (NE/OS), NE/NE, and NE/Craft communications. Users can easily operate the Loop-O9400R locally or remotely for centralized management.

Ordering Information

To specify options, choose from list below:

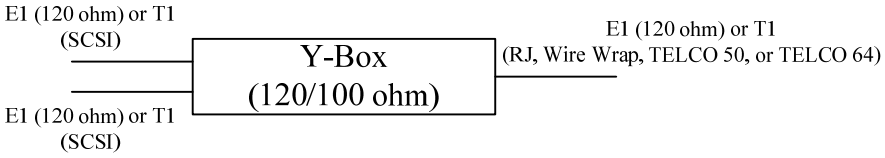
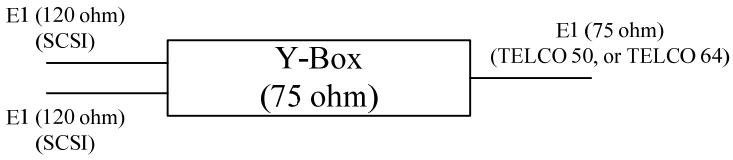
Note: RoHS compliant units are identified by the letter G appearing immediately at the end of the ordering code.

Note: If different environmental requirements are needed, please contact Loop's Marketing & Sales Team regarding availability.

Model	Description	Note
Main Unit		
Loop-O9400-R-CHA-**G**	6U height Rack chassis for O9400 without CPU and power modules	
CPU Modules and Supporting Plug-in Modules		
Loop-O9400-R-CC16-**G**	CPU module with cross-connect unit and two STM-1/4/16 (OC-3/12/48) interfaces without SFP (mini-GBIC) optical modules	One required for each chassis Order two for redundancy
Loop-O9400-R-CC4-**G**	CPU module with cross-connect unit and two STM-1/4 (OC-3/12) interfaces without SFP (mini-GBIC) optical modules	One required for each chassis Order two for redundancy
Loop-O9400-R-CBA-**G**	Connector Board	One required for each chassis
Loop-O9400-R –FANA-**G**	Fan Tray with temperature controlled board	One required for each chassis
Loop-O9400R-FILR-**G**	Air Filter Rack for O9400R, air filter included.	
Loop-O9400R-FILRCMA-**G**	Air Filter Rack with cable management for O9400R, 2U (88mm), air filter included	
Tributary Plug-in Modules		
Loop-O9400-R-16TE-**G**	16 E1(120 ohm) or 16 T1 software programmable interface plug-in module	Order two for redundancy
Loop-O9400-R-32TE-**G**	32 E1(120 ohm) or 32 T1 software programmable interface plug-in module	Order two for redundancy
Loop-O9400-R-63TE-**G**	63 E1(120 ohm) or 63 T1 software programmable interface plug-in module	Order two for redundancy
Loop-O9400-R-16E75-**G**	16 E1(75 ohm) interface plug-in module	Order two for redundancy
Loop-O9400-R-32E75-**G**	32 E1(75 ohm) interface plug-in module	Order two for redundancy
Loop-O9400-R-63E75-**G**	63 E1(75 ohm) interface plug-in module	Order two for redundancy
Loop-O9400-R-B16-**G**	STM-1/4 (OC-3/12) software programmable interface plug-in module without SFP (mini-GBIC) optical modules	Order two for redundancy
Loop-O9400-R-9EoS4NSW-**G**	1 GbE or 8FE software programmable interface plug-in module without L2 switch	Order two for redundancy
Loop-O9400-R-9EoS4SW-**G**	1 GbE and 8FE interface plug-in module with L2 switch	Order two for redundancy
Loop-O9400-R-3TE3-**G**	3 T3 or 3 E3 software programmable interface plug-in modules	Order two for redundancy
Loop-O9400-R-3TE3M13-**G**	3 T3 or 3 E3 software programmable interface plug-in modules with M13 /Mx3 function for T3 interface only	Order two for redundancy
Loop-O9400-R-7FOM-**G**	7-port Fiber Optical Interface with 7 SFP housings (SFP not included)	Order two for redundancy
Software		
Loop-O9400-R-3M13	A software key to activate the 3TE3 module to have M13 /Mx3 function for T3 interface only	

Accessories

SFP Optical Modules		
Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.		
User's Manual		
Loop-O9400-R-UMA	Optional, paper copy of User Manual. A CD version of the manual is already included as part of the standard package.	
Power Modules		
Loop-O9400-R-SD48-**G**	Single -48Vdc (-36 to -72Vdc) power module	• For redundancy purposes, ordering a second plug-in module will provide dual power. • For AC power module, choose an appropriate power cord.
Loop-O9400-R-SAD-**G**	Single AC and DC (coexistent) power module (90 to 240Vac, 50/60Hz and -36 to -72Vdc)	
Power Cord		
Loop-ACC-PC-USA	AC power cord for Taiwan/America	
Loop-ACC-PC-EU	AC power cord for Europe	
Loop-ACC-PC-UK	AC power cord for UK	
Loop-ACC-PC-AUS	AC power cord for Australia	
Loop-ACC-PC-CH	AC power cord for China	
Air Filter		
Loop-O9400R-FIL	Air Filter to fit Loop-O9400R-FILR Air Filter Rack	
Order Wire Phone		
Loop-O9400-R-OW-USA-**G**	Ethernet Order Wire phone (using VoIP technology) with America power plug	
Loop-O9400-R-OW-EU-**G**	Ethernet Order Wire phone (using VoIP technology) with Europe power plug	
SIP Proxy Server		
Loop-O9400-R-SIP	SIP proxy server basic software **Note:** One SIP proxy server license supports up to 25 phone lines. For phone lines exceeding 25, you need to purchase additional licenses for each increment of 25 lines.	Customer must provide a MAC address so that a license key can be generated to operate the software at that address.
Conversion Panels		
Loop-ACC-P-1SCSI-16RJ-**G**	One SCSI to sixteen RJ (1u height) without cable	Used with: Loop-O9400-R-16TE-**G,** Loop-O9400-R-32TE-**G,** Loop-O9400-R-63TE-**G**
Loop-ACC-P-1SCSI-16WW-**G**	One SCSI to sixteen Wire Wrap (1u height) without cable	Used with: All types of ET and E75 plug-in cards
Loop-ACC-P-1SCSI-16BNC-**G**	One SCSI to sixteen BNC (1.5u height) without cable	Used with: Loop-O9400-R-16E75-**G,** Loop-O9400-R-32E75-**G,** Loop-O9400-R-63E75-**G**

Y-box Panels for 120/100 ohm		
		
Loop-ACC-Y-2SCSI-16RJ-**G**	1u Y-box 16-port panel for two SCSI (E1(120 ohm) or T1) to 16 RJ (E1(120 ohm) or T1) connectors without cable	Using with Loop-O9400-R-16TE-**G,**
Loop-ACC-Y-2SCSI–16WW-**G**	1u Y-box 16-port panel for two SCSI (E1(120 ohm) or T1) to 16 Wire Wrap (E1(120 ohm) or T1) without cable	Using with Loop-O9400-R-16TE-**G,**
Loop-ACC-Y-2SCSI-2T50P8-16TE-**G**	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to two TELCO 50 (E1(120 ohm) or T1) connectors (8 ports per TELCO connector) without cable	Using with Loop-O9400-R-16TE-**G,**
Loop-ACC-Y-2SCSI-2T50P12-16TE-**G**	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to two TELCO 50 (E1(120 ohm) or T1) connectors (12 ports to the first TELCO connector, 4 ports to the second TELCO connector) without cable	Using with Loop-O9400-R-16TE-**G,**
Loop-ACC-Y-2SCSI-1T64P16-16TE-**G**	1u 16-port Y-box panel in (E1(120 ohm) or T1) for two SCSI to one TELCO 64 (E1(120 ohm) or T1) connectors (16 ports per TELCO connector) without cable	Using with Loop-O9400-R-16TE-**G,**
Loop-ACC-Y-4SCSI-4T50P8-32TE-**G**	1u 32-port Y-box panel in (E1(120 ohm) or T1) for four SCSI to four TELCO 50 (E1(120 ohm) or T1) connectors (8 ports per TELCO connector) without cable	Using with Loop-O9400-R-32TE-**G,** Loop-O9400-R-63TE-**G**
Loop-ACC-Y-4SCSI-3T50P12-32TE-**G**	1u 32-port Y-box panel in (E1(120 ohm) or T1) for four SCSI to three TELCO 50 (E1(120 ohm) or T1) connectors (12 ports to the first TELCO connector, 12 ports to the second TELCO connector and 8 ports to the third TELCO connector) without cable	Using with Loop-O9400-R-32TE-**G,** Loop-O9400-R-63TE-**G**
Loop-ACC-Y-4SCSI-2T64P16-32TE-**G**	1u 32-port Y-box panel in E1 120 ohm or T1 for four SCSI to two TELCO 64 (E1(120 ohm) or T1) connectors (16 ports per TELCO connector) without cable	Using with Loop-O9400-R-32TE-**G,** Loop-O9400-R-63TE-**G**
Y-box Panels for 75 ohm		
		
Loop-ACC-Y-2SCSI-2T50P8-16E75-**G**	1u 16-port Y-box panel for two SCSI (E1(120 ohm)) to two TELCO 50 (E1(75 ohm)) connectors (8 ports per TELCO connector) without cable	Using with Loop-O9400-R-16TE-**G**
Loop-ACC-Y-2SCSI-2T50P12-16E75-**G**	1u 16-port Y-box panel for two SCSI (E1(120 ohm)) to two TELCO 50 (E1(75 ohm))connectors (12 ports to the first TELCO connector, 4 ports to the second TELCO) straight without cable	Using with Loop-O9400-R-32TE-**G,** Loop-O9400-R-63TE-**G**

Loop-ACC-Y-2SCSI-1T64P16-16E75-**G**	1u 16-port Y-box panel for two SCSI (E1(120 ohm)) to one TELCO 64 (E1(75 ohm))connectors (16 ports per TELCO connector) straight without cable	Using with Loop-O9400-R-16TE-**G**
Loop-ACC-Y-4SCSI-4T50P8-32E75-**G**	1u 32-port Y-box panel for four SCSI (E1(120 ohm)) to four TELCO 50 (E1(75 ohm))connectors (8 ports per TELCO connector) without cable	Using with Loop-O9400-R-16TE-**G**
Loop-ACC-Y-4SCSI-3T50P12-32E75-**G**	1u 32-port Y-box panel for four SCSI (E1(120 ohm)) to three TELCO 50 (E1(75 ohm))connectors (12 ports to the first TELCO connector, 12 ports to the second TELCO connector and 8 ports to the third TELCO connector) without cable	Using for Loop-O9400-R-32TE-**G**, Loop-O9400-R-63TE-**G**
Loop-ACC-Y-4SCSI-2T64P16-32E75-**G**	1u 32-port Y-box panel for four SCSI(E1(120 ohm)) to two TELCO 64 (E1(75 ohm))connectors (16 ports per TELCO connector) without cable	Using with Loop-O9400-R-32TE-**G**, Loop-O9400-R-63TE-**G**
Conversion Cable		
Loop-ACC-CAB-SCSI68M-200-1SCSI68M	SCSI68/ Male to one SCSI68/Male; Length 200 cm	Used for all Conversion Panels and Y-box Panels

Note: Please contact sales representative near you for further detail info.

Blank Panels		
30.001076.A00LF	Blank panel for power supply slots	
30.001077.A00LF	Blank panel for other slots	

LOOP-O9400R SDH/SONET ADM/TM PRODUCT SPECIFICATIONS

Max. Number of Cross-connect Modules

4 STM-1/4 (OC-3/12) aggregate lines
4 STM-1/4/16 (OC-3/12/48) aggregate lines

Max. Number of Tributary Modules for STM1/4 (OC3/12) Cross-connect Module

1 STM-4 (OC-12) tributaries
8 STM-1 (OC-3) tributaries
18 E3/T3 tributaries
378 E1/T1 tributaries
6 GbE EoS tributaries
48 10/100M Ethernet EoS tributaries

Max. Number of Tributary Modules for STM1/4/16 (OC3/12/48) Cross-connect Module

4 STM-4 (OC-12) tributaries
16 STM-1 (OC-3) tributaries
24 E3/T3 tributaries
504 E1/T1 tributaries
8 GbE EoS tributaries
64 10/100M Ethernet EoS tributaries

SFP Module Characteristics(Please refer to SFP optical module brochure for detail)

E1 Interface

Line Rate	2.048 Mbps ± 50 ppm	Jitter	ITU G.823
Line Code	AMI/HDB3	Framing	Unframed with a framing monitor on receiving side
Input Signal	ITU G.703	Impedance	75 ohm coax/120Ω twisted pair
Output Signal	ITU G.703	Connector	SCSI-II 68-pin One connector for 16 ports Two connectors for 32 ports Four connectors for 63 ports
Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703		

T1 Interface

Line Rate	1.544 Mbps ± 32 ppm	Jitter	ITU G.824
Line Code	AMI/B8ZS	Framing	Unframed with a framing monitor on

			receiving side
Input Signal	ITU G.703 DSX-1 0dB to –6dB	Impedance	100 ohm twisted pair
Output Signal	ITU G.703 DSX-1 w/short (0-110, 110-220, 220-330, 330-440, 440-550, 550-660 (feet)	Connector	SCSI-II 68-pin One connector for 16 ports Two connectors for 32 ports Four connectors for 63 ports
Output Mask	Bellcore GR-499-core		

E3 Interface

Line Rate	34.368 Mbps ± 20ppm	Jitter	ITU G.823
Line Code	HDB3	Framing	Unframed, G.751
Input Signal	ITU G.703	Impedance	75 ohm coax
Output Signal	ITU G.703	Connector	BNC connector
Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703		

T3 interface

Line Rate	44.736 Mbps ± 20ppm	Jitter	ITU G.824
Line Code	B3ZS	Framing	Unframed, M13/Mx3 (unframed E1/T1), G.747
Input Signal	ITU G.703	Impedance	75Ω coax
Output Signal	ITU G.703	Connector	BNC connector
Output Mask	Bellcore GR-499-core		

Fast Ethernet interface

Line Rate	10/100M bps	Mapping	n x VC12, n x VC3 or n x VC4
Layer2 Protocol	RSTP (802.1W), VLAN (802.1Q, 802.1P) Flow Control (802.3X) MSTP (802.1S) IGMP Snooping QoS	Connector	RJ45
Process Protocol	VCAT, GFP(G.7041), LAPS, BCP, LCAS(G.7042) and non-LCAS		

Gigabit Ethernet interface

Line Rate	10/100/1000Mbps	Mapping	n x VC12, n x VC3 or n x VC4
Layer2 Protocol	RSTP (802.1W), VLAN (802.1Q, 802.1P) Flow Control (802.3X) MSTP (802.1S) IGMP Snooping QoS	Connector	RJ45
Process Protocol	VCAT, GFP(G.7041), LAPS, BCP, LCAS(G.7042) and non-LCAS		

7 FOM

Fiber Optical Interface

Port number	7		
Source	Laser	Line Code	Scrambled NRZ
Wavelength	1310 ± 50 nm, 1550 ± 40 nm		
Optical Line Rate	38.84Mbps		
Connector	SFP housing with LC type		
Reach	2~240 Km (For more detail, please refer to the SFP table below)	Protection	1+1 Line Protection

System Clock

Clock Source	Internal clock 4 aggregate lines clocks (STM-1/4 (OC-3/12)) 6 tributary clocks 2 external input clocks (ITU-T G.703 - 2.048 Mhz or E1 for STM-1/4, T1 for OC-3/12)
Clock Output	2 external output (E1 for STM-1/4, T1 for OC-3/12)

Management Interface

LED	Multi colors
Console	Electrical: RS232, DCE Connector: DB9, female User interface: Menu driven VT-100
Telnet	
SNMP	SNMPv1, RFC1213
OSS interface	10/100BaseT FE (IEEE 802.3u)
NE/NE interface	DCC/HDLC/PPP/Ethernet type II, In-band E1

Alarm Input/Output

Inputs

Ports	4	Activation current	3 mA
Internal resistance	1K	Deactivation current	1.5 mA
Connectors	RJ45		

Outputs

Ports	4	Maximum switching voltage	110 V DC, 125 V AC
Initial insul. resist.	Min. 100M ohm (at 500Vdc)		
Connectors	RJ45		

Diagnostics

XCU card

Loopback Test	Local loopback, payload loopback, line loopback	
BERT Test	Optical interface	Direction: to optical lines

B155/622 card

Loopback Test	Local loopback, payload loopback, line loopback:	
BERT Test	Optical interface	Direction: to optical lines

E1/T1 card

Loopback Test	Local loopback, line loopback:	
BERT Test	E1/T1 interface	Direction: to optical lines, to tributary lines

7 FOM card

Optical Fiber	Local and remote loopbacks
E1 Test Pattern	To optical direction or backplane direction

Performance Monitor

Performance Reports	Performance Parameters: Error Block (EB), Background Block Error (BBE), Error Second (ES), Burst Error Second (BES), Severe Error Second (SES), Unavailable Second (UAS)			
Alarm History	System Alarm	Alarm Cut Off, Power Loss/Uneqp, Fan Fail, Fan Module Uneqp, RBC Uneqp, Overheat, TS Sync Loss, Logon and Logout, Optical Port Uneqp, Card In, Card Out, Card Type Mismatch, Card Port Number Mismatch, Card Fail, Card Registration, SNCP Switch, MSP Switch, Trib Protection Sync, Standby XCU Takeover, Standby Trib Takeover, XCU Sync, SFP Tx Fail, SFP Rx Fail, SFP Temperature		
	SDH/SONET Line Alarm	SDH	Line	PI-LOS, RS-LOF, RS-TIM, RS-BIP UAS, MS-SD, MS-SF, MS-AIS, MS-RDI, MS-BIP UAS, MS-REI UAS
			Ho-Path	AU-LOP, AU-AIS, HP-SD, HP-SF, HP-TIM, HP-UNEQ, HP-PLM, HP-RDI-S, HP-RDI-C, HP-RDI-P, HP-BIP UAS, HP-REI UAS, LOM
			Lo-Path	TU-LOP, TU-AIS, LP-SD, LP-SF,
		SONET	Line	LOS-PI, LOF-S, TIM-S, BIP-S UAS, SD-L, SF-L, AIS-L, RDI-L , BIP-L UAS, REI-L UAS
			STS-Path	LOP-P, AIS-P, SD-P, SF-P, TIM-P, UNEQ-P, PLM- P, RDI-S-P, RDI-C-P, RDI-P-P, BIP-P UAS, REI-P UAS, LOM
			VT-Path	LOP-V, AIS-V, SD-V, SF-V
Alarm Queue	Contains up to 300 alarm records of latest alarm types, alarm severity, date and time.			

Alarm Input/Output

Inputs

Channel	4
Connector	RJ45
Internal Resistance	1K
Activation Current	3 ma
Deactivation Current	1.5 ma
Allowable Current	4 ma

Outputs

Channel	4
Connector	RJ45
Initial Insulation Resistance	Min. 100M ohm (at 500Vdc)
Maximum switching voltage	110 V DC, 125 V AC

Power

AC and DC coexistent module	90 to 240Vac, 50/60Hz, -48Vdc (-36 to -72Vdc)
DC module	-48Vdc (-36 to -72Vdc)

Physical and Environmental

Dimensions for 6U	433 x 264 x 223.5mm (W/H/D)
Dimension for Air Filter Rack	433 x 22 x 223.5mm (WxHxD)
Dimension for Air Filter Rack A with cable management	433 x 88 x 223.5mm (WxHxD)
Dimension for Y-Box	432 x 44 x 100 mm (Wx HxD)
Dimension for Conversion Panel	RJ connector: 432 x 44 x 23mm (WxHxD) WW connector: 432 x 44 x 40mm (WxHxD) BNC connector: 432 x66 x 53mm (WxHxD)
Temperature	0 to 50°C
Humidity	0-95%RH (non-condensing)
Mounting	Desk-top stackable, 19/23 inch rack mountable

Standards Compliance

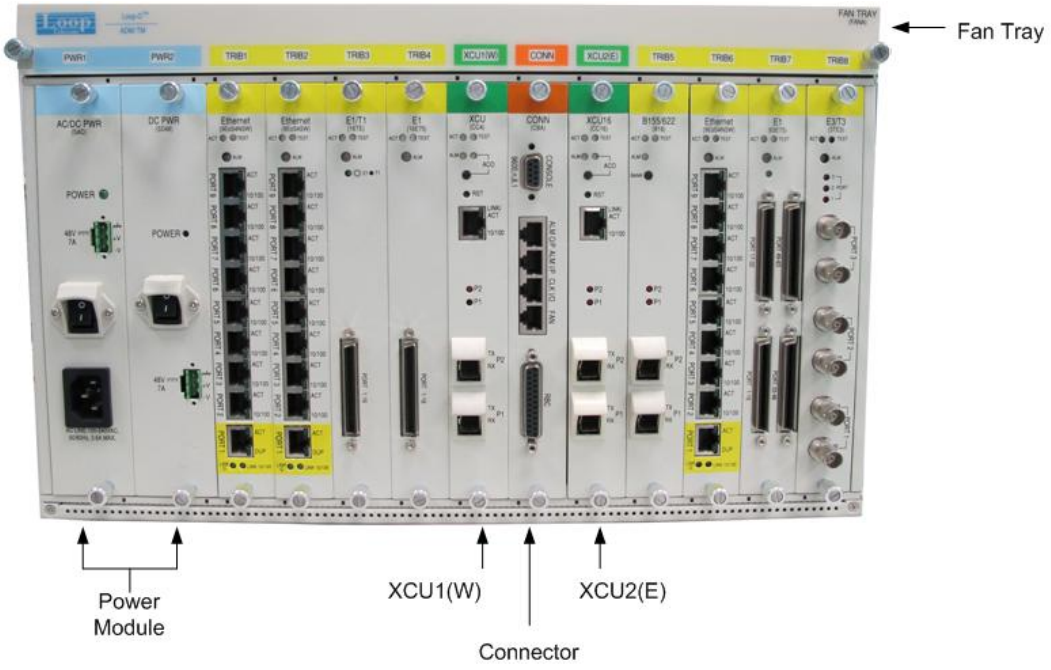
ITU-T	G.703, G.707, G.751, G.747, G.7041, G.7042, G.775, G.783, G.806, G.813, G.823, G.824, G.826, G.841, G.747, X.86, G.664
ANSI	T1.105, T1.107
IEEE	802.1q (VLAN), 802.1w (RSTP), 802.1s(MSTP), 802.1ad (stack VLAN), 802.3x (flow control), 802.3u, 802.1p (QoS)

Certification

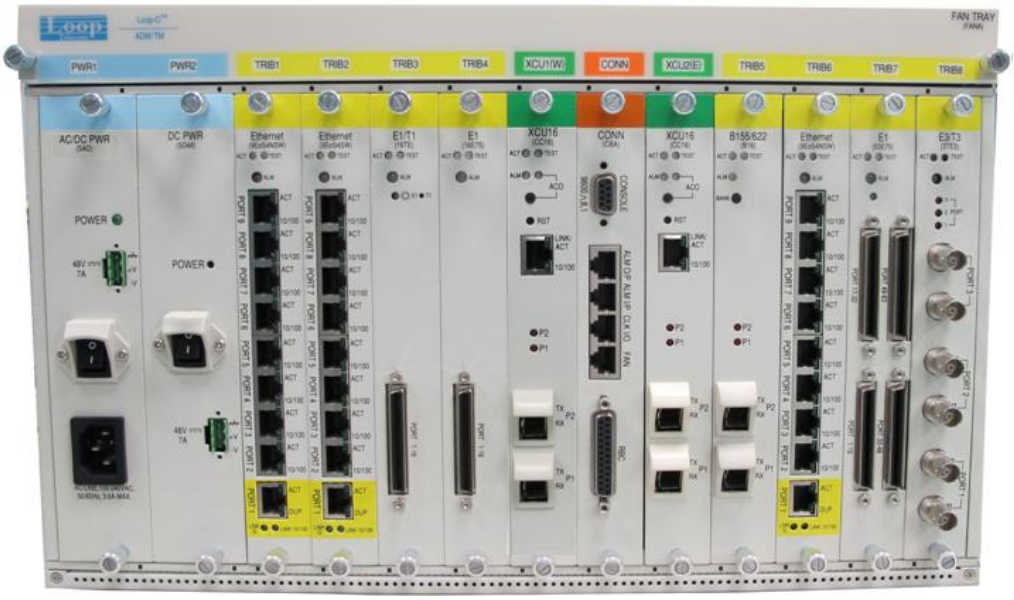
EMC	FCC Part 15 Subpart B, Class A; EN 55022, Class A; EN55024; EN300 386
Safety	IEC60950-1/EN 60-950-1

Loop-O9400R Front Panel

Controller STM-1/4 (OC-3/12)



Controller STM-1/4/16 (OC-3/12/48)



Loop-O9400R Card Type and Capacity Reference Table

Table 1 STM-1/4 (OC3/12) Aggregate Line

In this table, STM-4 could also be OC-12; STM-1 could also be OC-3; E1 could also be T1; and E3 could also be T3.

SLOTS	TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU1(W)		XCU2(E)	TRIB 5	TRIB 6	TRIB7	TRIB 8
GLOBAL PAYLOAD SDH	155M		155M		8 x 155M		8 x 155M	2 x 155M	N/A	4 X 155M	N/A
								1 x 155M	1 x 155M	2 x 155M	2 x 155M
Tributary (Plug-in Modules)											
Link without MSP	STM-1	N/A	STM-1	N/A	STM-1/4 (2 ports)		STM-1/4 (2 ports)	STM-1	STM-1	STM-1 (2 ports)	STM-1 (2 ports)
	STM-1	N/A	STM-1	N/A	STM-1/4 (2 ports)		STM-1/4 (2 ports)	STM-1	STM-1	STM-4	N/A
	STM-1	N/A	STM-1	N/A	STM-1/4 (2 ports)		STM-1/4 (2 ports)	STM-1 (2 ports)	N/A	STM-1 (2 ports)	STM-1 (2 ports)
Link with MSP (1+1)	STM-1	STM-1(B)	STM-1	STM-1(B)	STM-1/4 (2 ports)		STM-1/4 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1 (2 ports)	STM-1 (2 ports) (B)
	STM-1	STM-1(B)	STM-1	STM-1 (B)	STM-1/4 (2 ports)		STM-1/4 (2 ports)	STM1-1 (2 ports)	STM-1 (2 ports) (B)	STM-4	STM-4 (B)
Link with SNCP Ring *See Note 1	N/A	N/A	N/A	N/A	STM-1/4 (2 ports)	CONNECTOR	STM-1/4 (2 ports)	STM-1	STM-1	STM-1 (2 ports)	STM-1 (2 ports)
Link with Link with SNCP Ring & MSP (1+1) *See Note 2	N/A	N/A	N/A	N/A	STM-1/4 (2 ports)		STM-1/4 (2 ports)	N/A	N/A	N/A	N/A
Max 378 E1 (Single)	63 E1	N/A	63 E1	N/A				63 E1	63 E1	63 E1	63 E1
Max 252 E1 (Protection)	63 E1	63 E1 (B)	63E1	63 E1 (B)				63 E1	63 E1 (B)	63 E1	63 E1 (B)
Max. 18 E3 (Single)	3 E3	N/A	3 E3	N/A				3 E3	3 E3	3 E3	3 E3
Max 12 E3 (Protection)	3 E3	3 E3 (B)	3 E3	3 E3 (B)				3 E3	3 E3 (B)	3 E3	3 E3 (B)
Max 48 10/100 BT 6x 1000BT (Single)	8x10/100 BT 1 x 1000BT	N/A	8x10/100BT 1 x 1000BT	N/A				8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100 BT 1 x 1000BT
Max 32 10/100 BT 4 x 1000 BT (Protection)	8x10/100 BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)				8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100 BT 1 x 1000BT (B)

Note 1: (B) signifies backup/protection

Note 2: XCU1(W) port 1 and XCU2(E) port 1 form Ring #1

XCU1(W) port 2 and XCU2(E) port 2 form Ring #2

Trib5 port 1 and Trib6 port 1 form Ring #3

Trib7 port 1 and Trib8 port 1 form Ring #4

Trib7 port 2 and Trib8 port 2 form Ring #5

Total Capacity= 5 Rings.

Note 3: XCU1(W) port 1 and XCU2(E) port 1 with MSP (1+1) protection

XCU1(W) port 2 and XCU2(E) port 2 with MSP (1+1) protection

XCU1(W) port 1 and XCU2(E) port 2 form a ring

These four ports form one STM-1/4 Main Ring with MSP (1+1) protection

Loop-O9400R Card Type and Capacity Reference Table

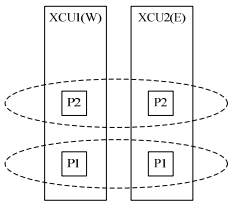
Table 2 STM-1/4/16 (OC3/12/48) Aggregate Line

In this table, STM-16 could be OC-48, STM-4 could also be OC-12; STM-1 could also be OC-3; E1 could also be T1; and E3 could also be T3.

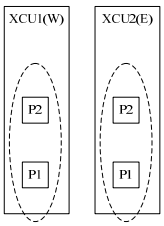
SLOTS	TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU1(W)		XCU2(E)	TRIB 5	TRIB 6	TRIB7	TRIB 8
GLOBAL PAYLOAD SDH	4 X 155M	N/A	4 X 155M	N/A	2 x 2.5G		2 x 2.5G	4 X 155M	N/A	4 X 155M	N/A
	2 x 155M	2 x 155M	2 x 155M	2 x 155M				2 x 155M	2 x 155M	2 x 155M	2 x 155M
Tributary (Plug-in Modules)											
Link without MSP	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)
	STM-4	N/A	STM-4	N/A	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-4	N/A	STM-4	N/A
Link with MSP (1+1) See Note 1	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports) (B)	STM-1 (2 ports)	STM-1 (2 ports) (B)
	STM-4	STM-4 (B)	STM-4	STM-4 (B)	STM-1/4/16 (2 ports)		STM-1/4/16 (2 ports)	STM-4	STM-4 (B)	STM-4	STM-4 (B)
Max 504 E1 (Single)	63 E1	63 E1	63 E1	63 E1		CONNECTOR		63 E1	63 E1	63 E1	63 E1
Max 252 E1 (Protection)	63 E1	63 E1 (B)	63 E1	63 E1 (B)				63 E1	63 E1 (B)	63 E1	63 E1 (B)
Max. 24 E3 (Single)	3 E3	3 E3	3 E3	3 E3				3 E3	3 E3	3 E3	3 E3
Max 12 E3 (Protection)	3 E3	3 E3 (B)	3 E3	3 E3 (B)				3 E3	3 E3 (B)	3 E3	3 E3 (B)
Max 64 10/100 BT 8x 1000BT (Single)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT				8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT
Max 32 10/100 BT 4 x 1000 BT (Protection)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)				8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)	8x10/100BT 1 x 1000BT	8x10/100BT 1 x 1000BT (B)
Max 56FOM (Single)	7 FOM	7 FOM	7 FOM	7 FOM				7 FOM	7 FOM	7 FOM	7 FOM
Max 28 FOM (Protection)	7 FOM	7 FOM (B)	7 FOM	7 FOM (B)				7 FOM	7 FOM (B)	7 FOM (B)	7 FOM (B)

Note 1: (B) signifies backup/protection

Note 2: With MSP (1+1) protection, the protection pair on XCU (W) and XCU (E) are as follows:



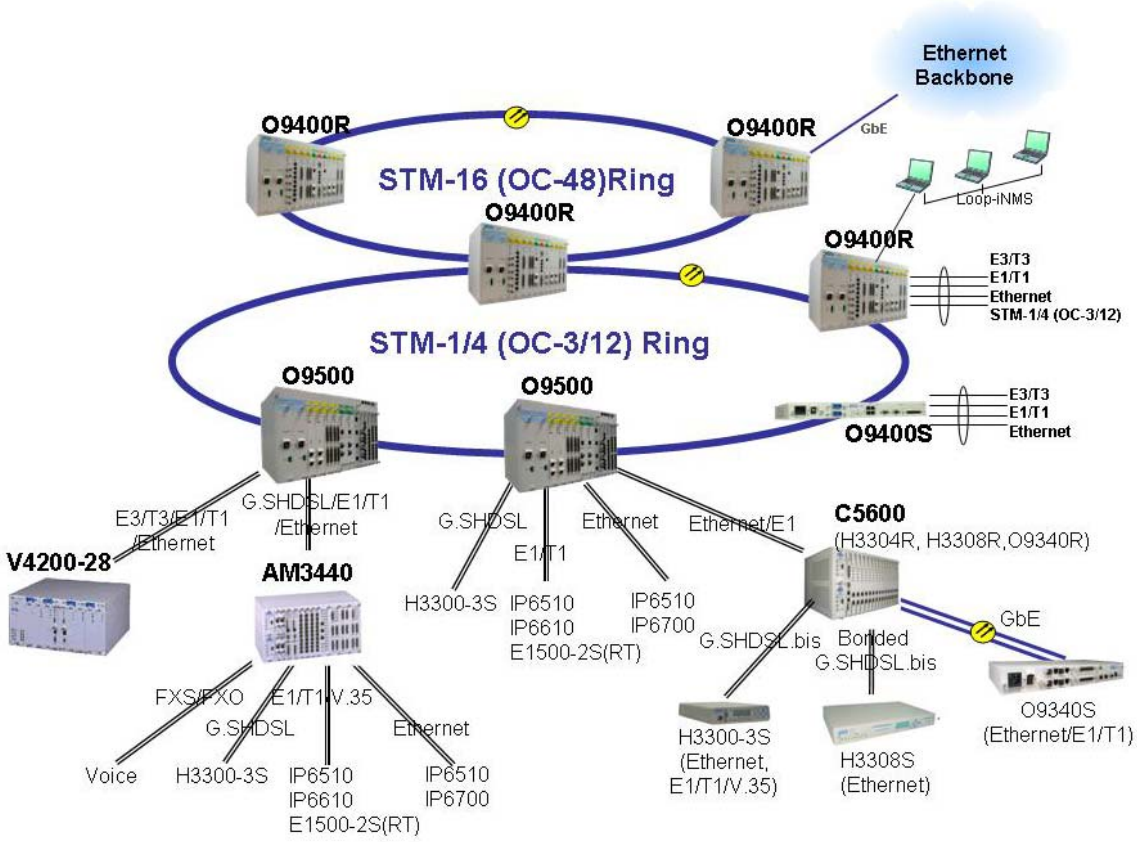
XCU (W) port 1 and XCU (E) port 1
XCU (W) port 2 and XCU (E) port 2



XCU (W) port 1 and XCU (W) port 2
XCU (E) port 1 and XCU (E) port 2

Applications:

1. Total Solution for IP/Voice Data Application



2. Rings with STM-1/4/16 (CC16) Capability

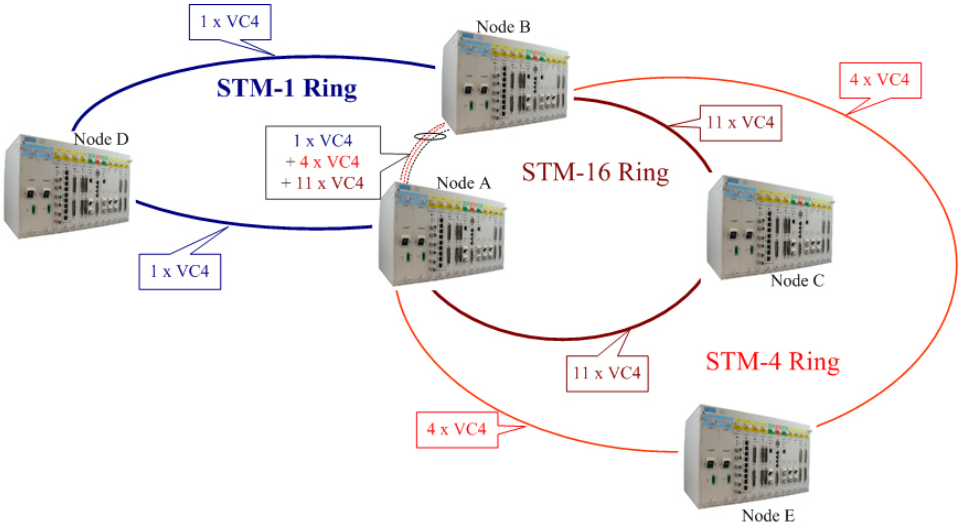
With STM-16 (CC16) capability, multi-rings can share the bandwidth in one optical line.

Nodes A, B, and C form a STM-16 Ring

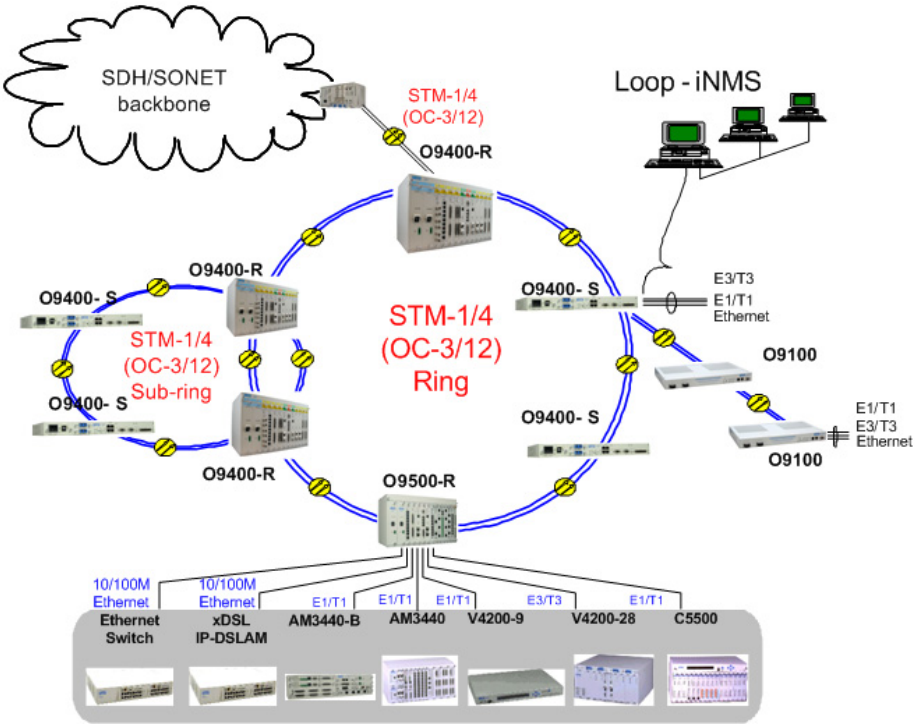
Nodes A, B, and E form a STM-4 Ring

Nodes A, B, and D form a STM-1 Ring

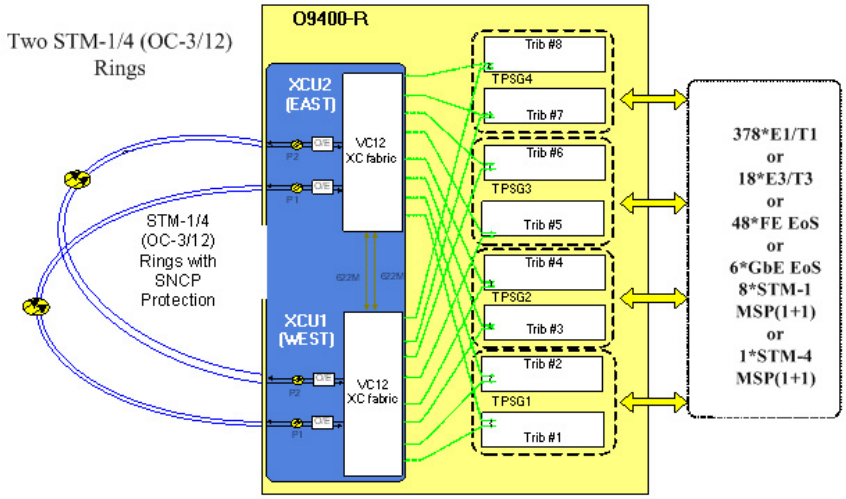
Nodes A and B only need one optical line to connect these three Rings.



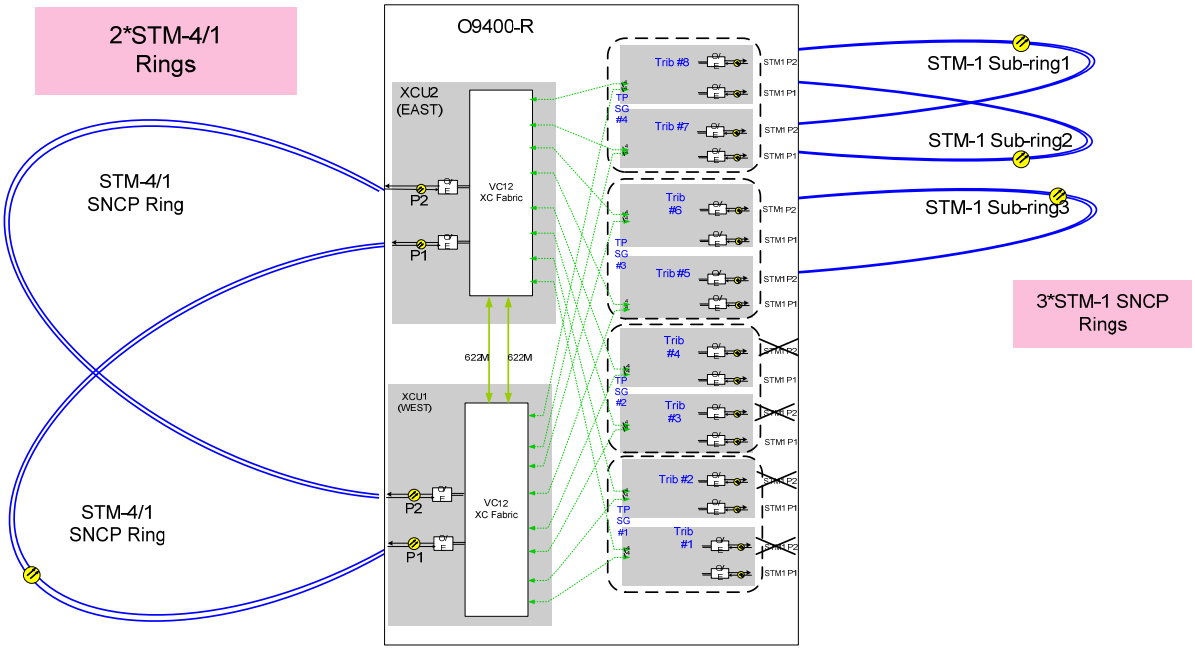
3. Rings with STM-1/4 Applications



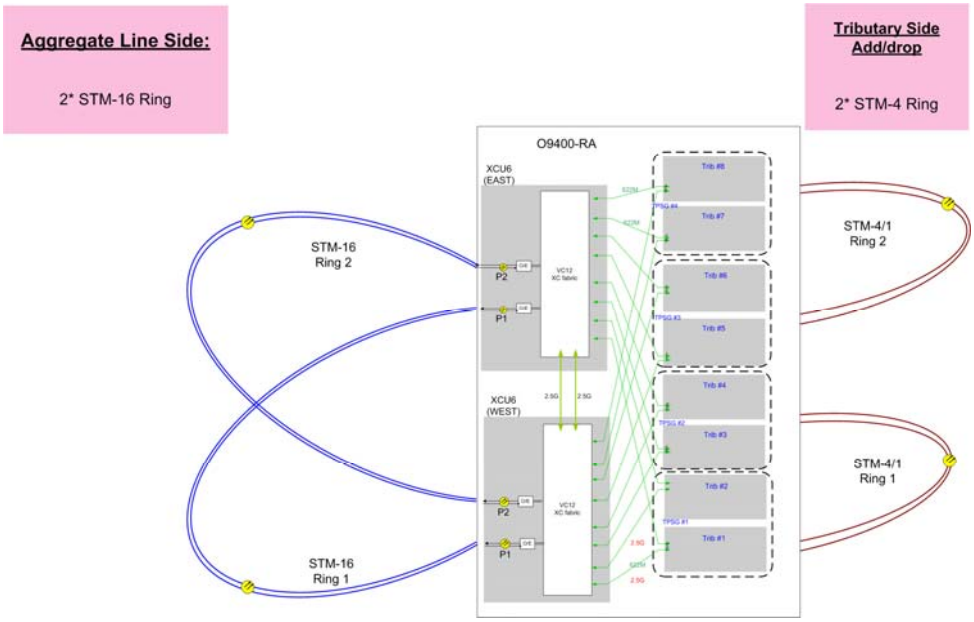
4. Two Ring Protection (CC4)



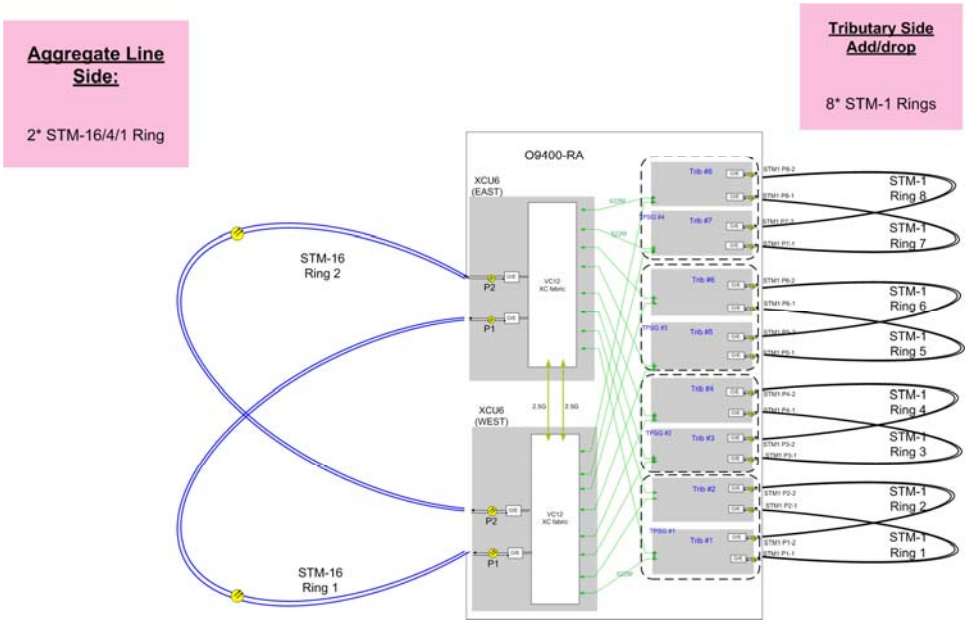
5. Five Rings (CC4)



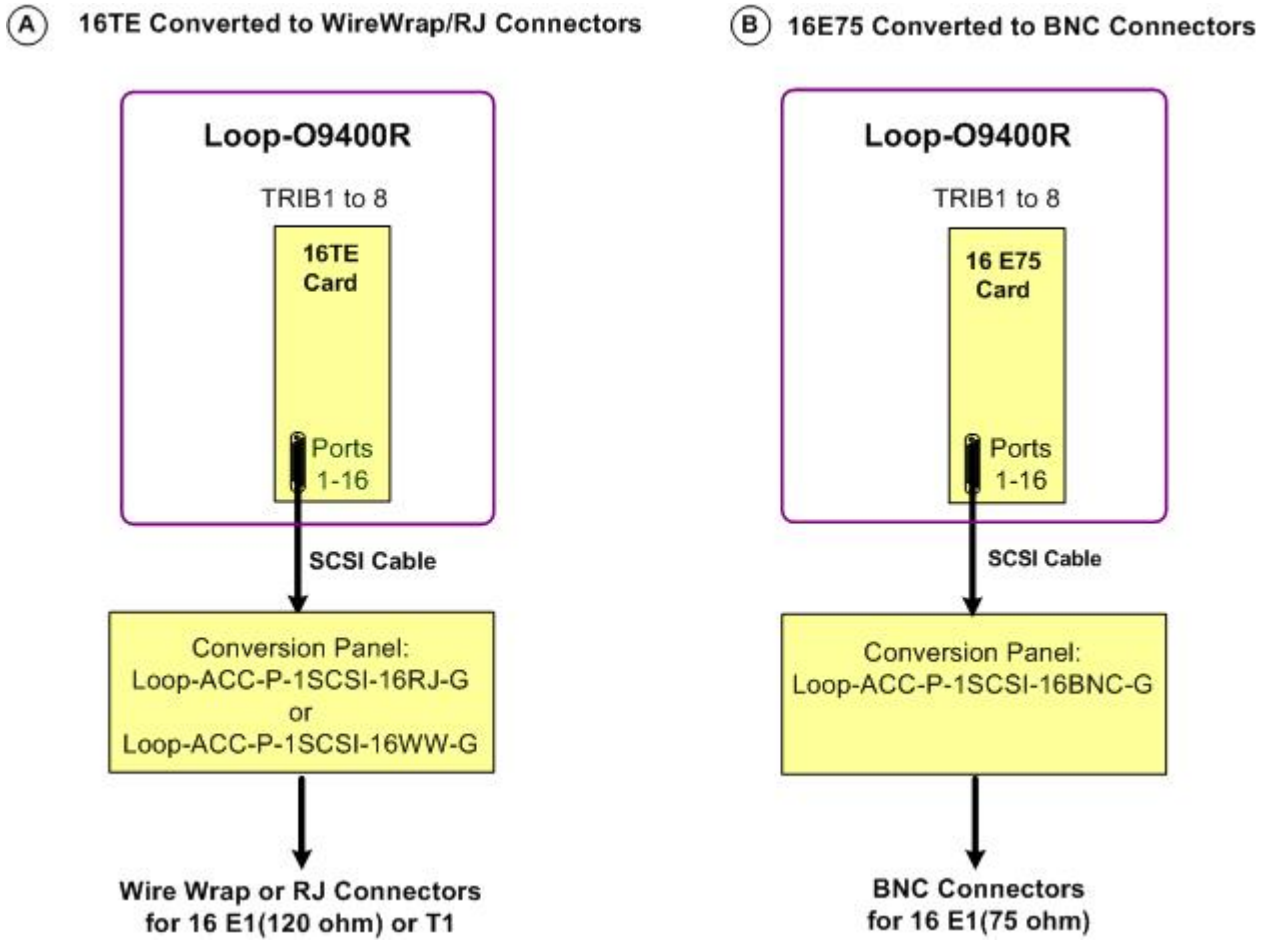
6. 2*STM-16 Ring + 2*STM-4 Ring (CC16)



7. 2*STM-16 Ring + 8*STM-1 Ring (CC16)



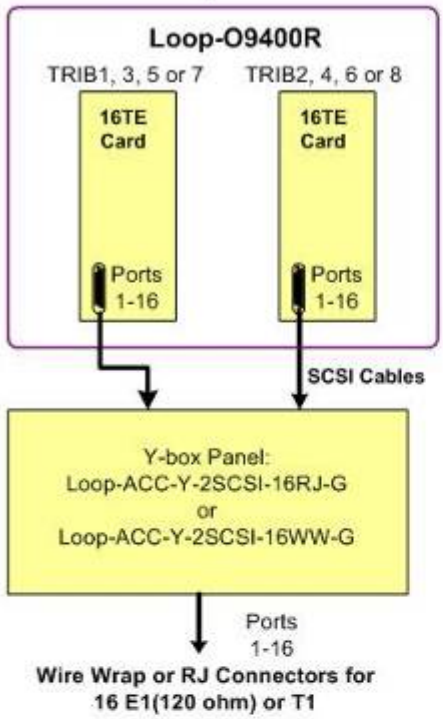
Conversion Panel Illustrations



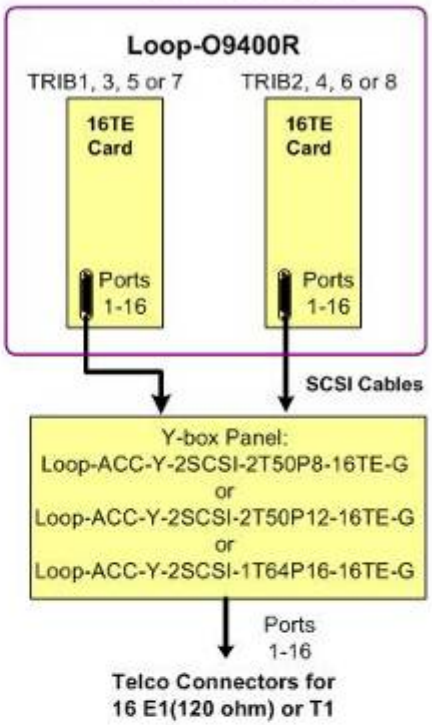
Note: One conversion panel has the capacity to handle sixteen ports. The sixteen port applications illustrated above require only one conversion panel. Thirty-two port (32TE, 32E75) applications will require two conversion panels and sixty-three port (63TE, 63E75) applications will require four conversion panels.

Y-box Illustrations

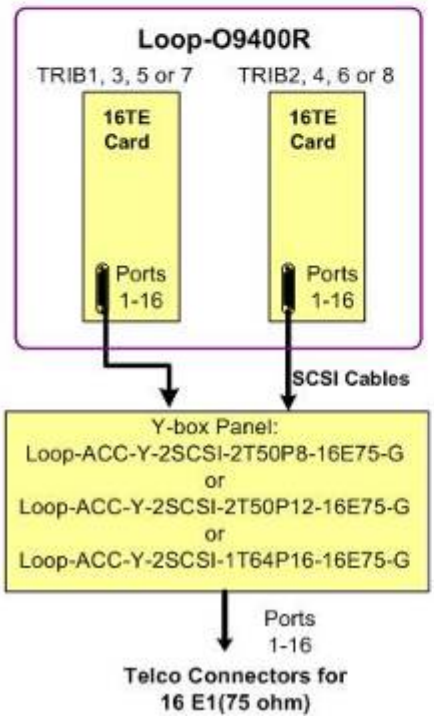
Ⓐ 16TE Card/Port Protection via Y- box Panel to 16 E1(120 ohm) or T1 WireWrap/RJ Connectors



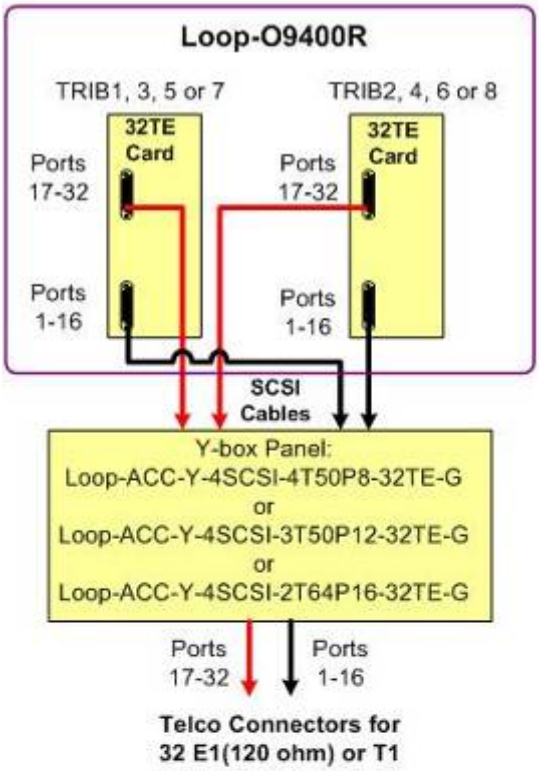
Ⓑ 16TE Card/Port Protection via Y- box Panel to Telco 16 E1(120 ohm) or T1 Connectors



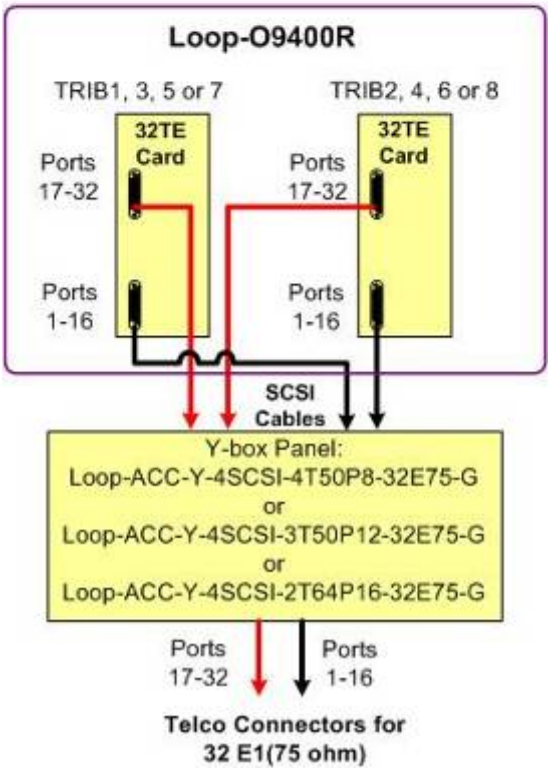
Ⓒ 16TE Card/Port Protection via Y- box Panel to Telco 16 E1(75ohm) Connectors



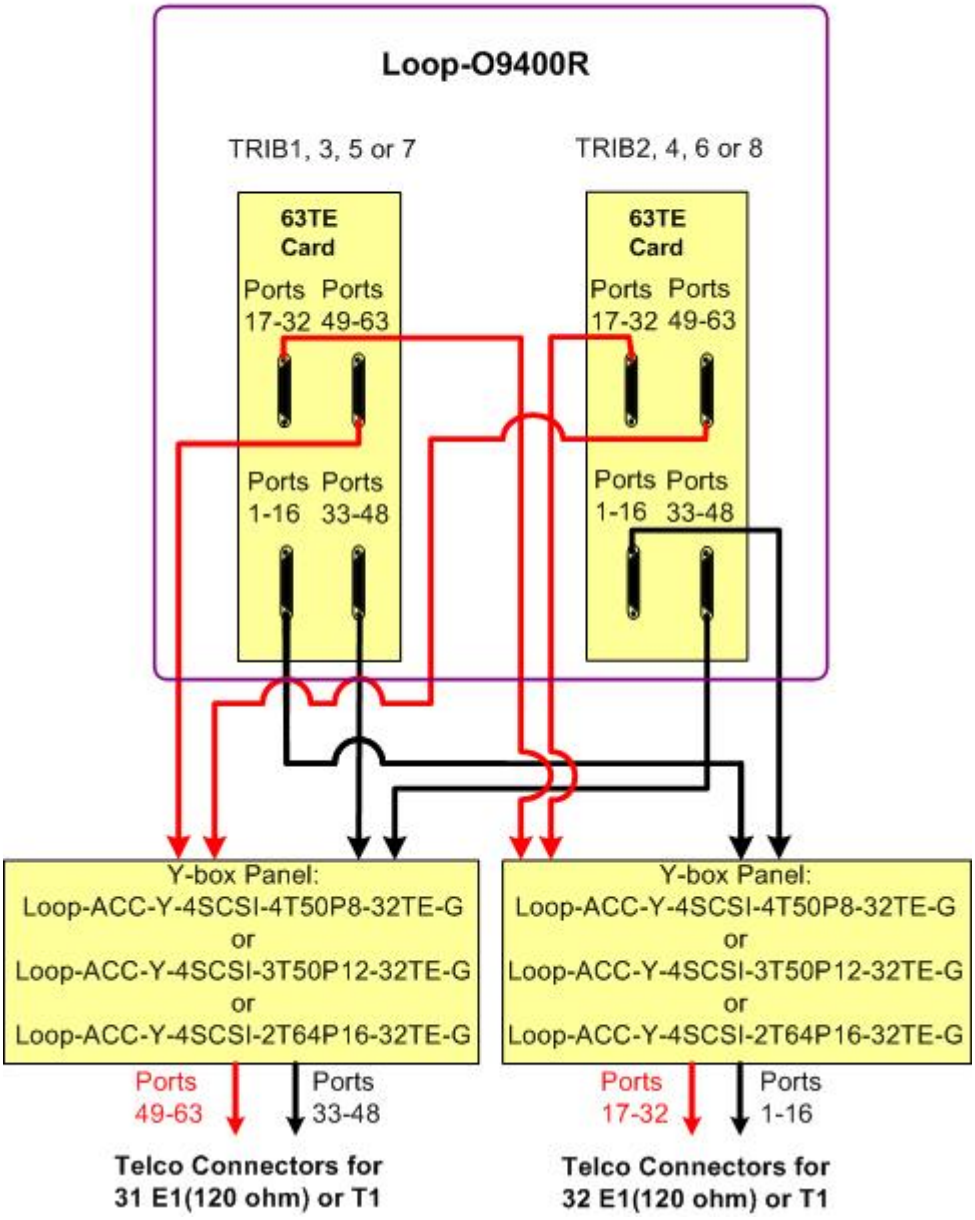
Ⓓ **32TE Card/Port Protection via Y- box Panel to Telco 32 E1(120 ohm) or T1 Connectors**



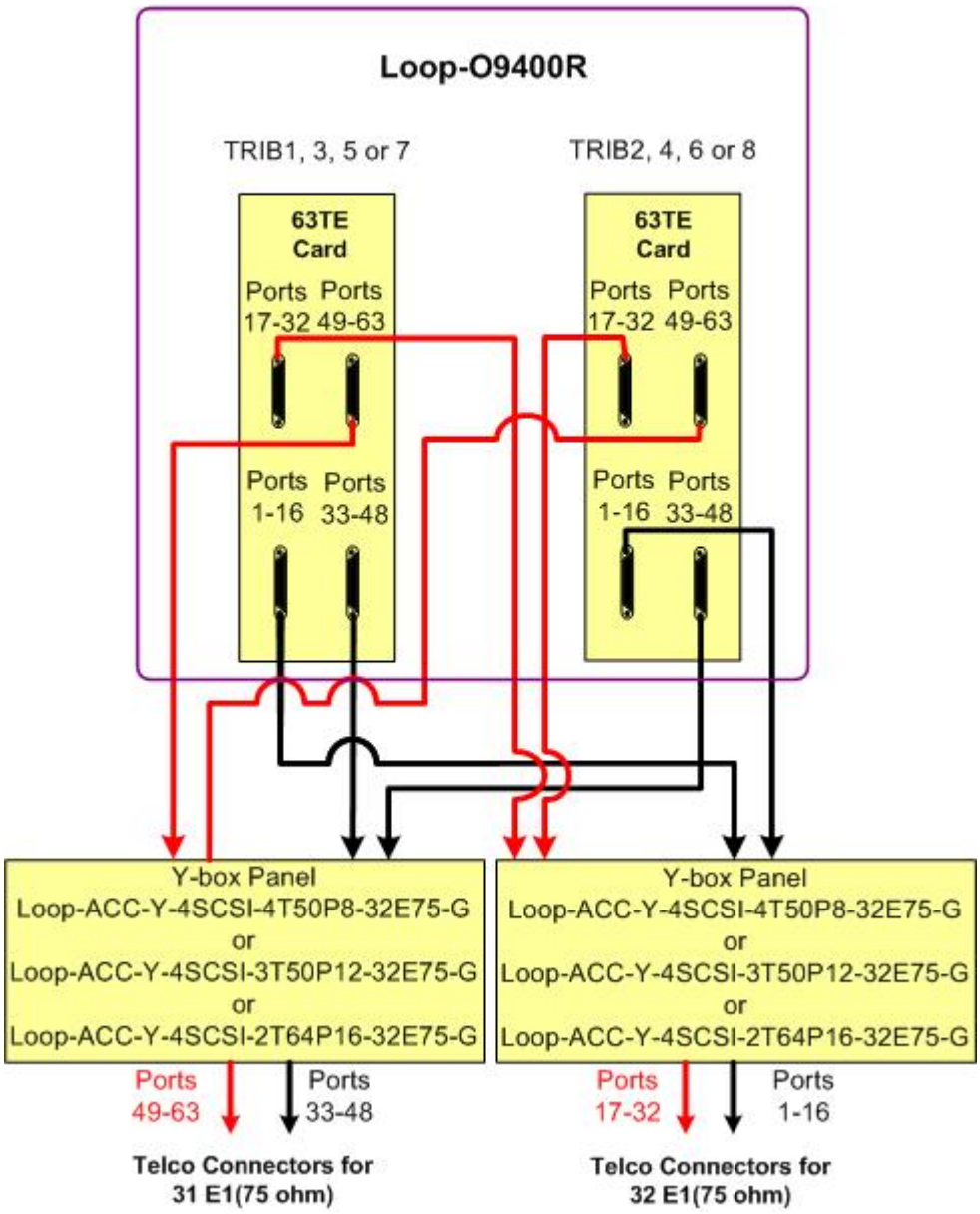
Ⓔ **32TE Card/Port Protection via Y- box Panel to Telco 32 E1(75 ohm) Connectors**



Ⓕ **63TE Card/Port Protection via Y- box Panel to Telco Connectors for 32 E1(120 ohm) or T1 and Telco Connectors for 31 E1(120 ohm) or T1**



Ⓖ 63TE Card/Port Protection via Y- box Panel to Telco Connectors for 32 E1(75 ohm) and Telco Connectors for 31 E1(75 ohm)



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